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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,415	10/16/2003	Kentaro Asakura	33082M991	7860

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SMITH, GAMBRELL & RUSSELL
1130 CONNECTICUT AVENUE, N.W., SUITE 1130
WASHINGTON, DC 20036

EXAMINER	
KACKAR, RAM N	
ART UNIT	**PAPER NUMBER**
1792	
MAIL DATE	**DELIVERY MODE**
05/13/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)	
Office Action Summary	10/685,415	ASAKURA ET AL.	
	Examiner	**Art Unit**	
	Ram N. Kackar	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/18/2008*.
2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12,13,15 and 16* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *12,13,15 and 16* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 12-13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US 6464794) in view of Zhao et al (US 6051286).**

Park et al disclose a film deposition method where a substrate (Fig 4-10) is set on a stage by using a guide ring (Col 4 lines 5-12 and Col 11 lines 15-36) and a deposition process is conducted on it (Col 4 lines 5-12). Park et al disclose a particle generation preventing space (Fig 17 and 18 under guide ring 830) and further teach that after processing a specified number of wafers a chamber cleaning procedure is conducted (Col 12 lines 1-12). Regarding the height of the particle generation space it is clear from Fig 18 that the height and width are related and have ratio greater than 3. However, these dimensions are process related, depending upon ion energies reaction species and size of the dark space and therefore optimizable.

Regarding unnecessary films deposited on wall surfaces, it is inherent that the deposition will be uneven and may have peaks that is why a cleaning step is taught since a deposition have a tendency to generate particles.

Regarding unnecessary films peeling off and accumulating in the particle generation preventing space it is inherent that the same thing will happen in Park et al et al due to the existence of such a space.

Regarding shape of particle generation preventive space, it is noted that the shape will not change.

Regarding determination of the height of the particle generation preventing space based upon consideration of a cleaning cycle and deposition rate, it is obvious that during use the space will accumulate deposition and after some cycles when the deposition is greater than a predetermined thickness, the guide ring will need to be changed. Higher the deposition rate shorter the time for deposition to reach that predetermined thickness. Similarly for smaller height of this space smaller thickness on walls will clog the space to make the guide ring unusable.

Park et al do not disclose that their invention is applicable only to processing using only certain gases. Specifically Park et al do not disclose using $TiCl_4$ for the deposition of for example TiN.

Zhao et al disclose using $TiCl_4$ and a guide ring (746, 246, 346, 446 or 646) of the type disclosed by Park et al and could use the invention for guidance and reduction of contamination.

Therefore using a Park et al like guide ring with using $TiCl_4$ would have been obvious to one of ordinary skill in the art at the time of invention.

3. Claims 12-13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denning et al (US 6451181) in view of Chin Fong Lee (US 6162336) and further in view of Zhao et al (US 6051286).

Denning et al disclose a film deposition method where a substrate (Fig 4-22) is set on a stage and a deposition process is conducted on it (abstract). Denning et al disclose a clamp to reduce particle generation (Col 8 lines 21-24) and particle generation preventing space (Fig 5) and further teach that after processing a specified number of wafers a chamber cleaning procedure is conducted (Col 7 lines 58-65). The height of the particle generation space (104) is disclosed to be 8 mil (0.2 mm) (Col 9 lines 21-22) and width to be more than 20mil (.5 mm)(Col 9 lines 40-41). Further it is clear from Fig 7 that the height and width are related and have ratio greater than 3. However, these dimensions are process related, depending upon ion energies and size of the dark space and therefore optimizable.

Regarding unnecessary films deposited on wall surfaces, it is inherent that the deposition will be uneven and may have peaks as disclosed in (Fig 5-110) that is why a cleaning step is taught since the deposition of this type may have a tendency to peel off and generate particles.

Regarding unnecessary films peeling off and accumulating in the particle generation preventing space it is inherent that the same thing will happen in Denning et al due to the existence of such a space.

Regarding shape of particle generation preventive space, it is noted that the shape will not change (will still remain rectangular). Size might change only during load/unload and will revert back to same after load/unload.

Denning et al do not disclose guiding the substrate using the guiding ring to set on the chuck.

Chin Fong Lee discloses a particle generation preventing space of 0.2mm and the length nearly 2mm (Fig 3-33 Col 4 lines 34-36). It is however understood by one of ordinary skill in the art that these are parameters depend upon size of substrates and the process and are adjusted as per need and considered obvious. Further Chin Fong Lee discloses guiding the substrate using the guiding ring to set on the chuck (Fig 4-50 and Col 6 line 51-56 and line 65-66).

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have a facility to guide the substrate for proper alignment and a narrow space of the order of mm in order to prevent unnecessary deposition in order to reduce particulate generation.

As discussed above regarding determination of the height of the particle generation preventing space, it is obvious that during use the space will accumulate deposition and after some cycles when the deposition is greater than a predetermined thickness, the guide ring will need to be changed. Higher the deposition rate shorter the time for deposition to reach that predetermined thickness. Similarly for smaller height of this space smaller thickness on walls will clog the space to make the guide ring unusable.

Denning et al and Chin Fong Lee do not disclose that their invention is applicable only to processing using only certain gases. Specifically they do not disclose using $TiCl_4$ for the deposition of for example TiN.

Zhao et al disclose using $TiCl_4$ and a guide ring (746, 246, 346, 446 or 646) of the type disclosed by Park et al and could use the invention for guidance and reduction of contamination.

Therefore using a Denning et al like guide ring with using $TiCl_4$ would have been obvious to one of ordinary skill in the art at the time of invention.

4. Claims 12-13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over (Applicants Admitted Prior Art) in view of Chin Fong Lee (US 6162336).

AAPA discloses all the limitations of these claims except the particle generation preventing space

Chin Fong Lee discloses a particle generation preventing space of 0.2mm and the length nearly 2mm (Fig 3-33 Col 4 lines 34-36). It is however understood by one of ordinary skill in the art that these parameters depend upon size of substrates and the process and are adjusted as per need and considered obvious.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have a narrow space of the order of mm in order to prevent unnecessary deposition in order to reduce particulate generation.

As discussed above regarding determination of the height of the particle generation preventing space, it is obvious that during use the space will accumulate deposition and after some cycles when the deposition is greater than a predetermined thickness, the guide ring will need to be changed. Higher the deposition rate shorter the time for deposition to reach that predetermined thickness. Similarly for smaller height of this space smaller thickness on walls will clog the space to make the guide ring unusable.

5. Claims 12-13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over (Applicants Admitted Prior Art) in view of Denning et al (US 6451181)

AAPA discloses all the limitations of these claims except the particle generation preventing space.

Denning et al disclose a film deposition method where they disclose a particle generation preventing space (Fig 5) and further teach that after processing a specified number of wafers a chamber cleaning procedure is conducted (Col 7 lines 58-65). The height of the particle generation space (104) is disclosed to be 8 mil (0.2 mm) (Col 9 lines 21-22) and width to be more than 20mil (.5 mm)(Col 9 lines 40-41). Further it is clear from Fig 7 that the height and width are related and have ratio greater than 3. However, these dimensions are process related, depending upon ion energies and size of the dark space and therefore optimizable.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to use a particle generation preventing space in AAPA to reduce contamination.

As discussed above regarding determination of the height of the particle generation preventing space, it is obvious that during use the space will accumulate deposition and after some cycles when the deposition is greater than a predetermined thickness, the guide ring will need to be changed. Higher the deposition rate shorter the time for deposition to reach that predetermined thickness. Similarly for smaller height of this space smaller thickness on walls will clog the space to make the guide ring unusable.

Response to Arguments

Applicant's arguments filed 1/18/2008 have been fully considered but they are not persuasive.

Applicant’s arguments related to new amendments are addressed above.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ram N Kackar/
Primary Examiner, Art Unit 1792